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IN THE CLAIMS

1. (Previously Presented) An optical imaging system comprising:

at least one optical phase filter;

a first controller for positioning the optical phase filter to alter phase of a wavefront of the imaging system and change one or both of (a) a depth of field and (b) aberration tolerance of the imaging system;

a user interface for selecting at least one of the depth of field and aberration tolerance; and

a second controller, responsive to user selections at the interface, to direct the first controller to position the optical phase filter to change the depth of field and aberration tolerance, as selected.

2. (Cancelled)

3. (Original) The optical imaging system of claim 1, the at least one optical phase filter comprising first and second optical filters.

4. (Previously Presented) An optical imaging system to variably control image properties of an image, comprising:

at least one optical phase filter comprising a circularly symmetric phase form of $P(r,\theta) = A(r,\theta) + B(r)$, wherein r denotes a filter radius value and θ denotes a filter angular coordinate;

a first controller for positioning the optical phase filter to alter phase of a wavefront of the imaging system to select the properties of the image;

a user interface for selecting a magnitude of at least one of the image properties; and

a second controller, responsive to user selections at the interface, to direct the first controller to position the optical phase filter and affect the magnitude.

5. (Previously Presented) The optical imaging system of claim 1, the optical phase filter comprising aspheric optical elements.

6. (Previously Presented) The optical imaging system of claim 1, the first controller comprising a motor.

7. (Previously Presented) The optical imaging system of claim 1, the first controller translating the optical phase filter between at least two positions wherein the wavefront passes through at least two separate portions of the optical phase filter.

8. (Previously Presented) The optical imaging system of claim 1, the first controller rotating the optical phase filter about an optical axis to effect phase changes to the wavefront.

9. (Cancelled)

10. (Previously Presented) An optical imaging system to variably control image properties of an image, comprising:

at least one optical phase filter disposed proximal to one of an aperture stop of the optical system and an image of the aperture stop;

a first controller for positioning the optical phase filter to alter phase of a wavefront of the imaging system to select the properties of the image;

a user interface for selecting a magnitude of at least one of the image properties; and

a second controller, responsive to user selections at the interface, to direct the first controller to position the optical phase filter and affect the magnitude.

11 (Previously Presented) An optical imaging system to variably control image properties of an image, comprising:

at least one optical phase filter;

a first controller for positioning the optical phase filter to alter phase of a wavefront of the imaging system to select the properties of the image;

a user interface for selecting a magnitude of at least one of the image properties; and

a second controller, responsive to user selections at the interface, to direct the first controller to position the optical phase filter and affect the magnitude;

a detector for capturing an image of the object; and

a post processor for processing data from the detector to reverse effects induced by the optical phase filter.

12. (Original) The optical imaging system of claim 11, wherein the post processor comprises a digital filter.

13. (Cancelled)

14. (Previously Presented) The optical imaging system of claim 1, wherein the first controller comprises an automatic motor.

15. (Cancelled)

16. (Original) The optical imaging system of claim 1, wherein the optical phase filter comprises a phase mask.

17. (Previously Presented) The optical imaging system of claim 16, wherein the phase mask implements a phase function of the form:

$P(r,\theta)_c = [2\cos(3\phi)]\ \alpha\ r^3 \cos(3\theta)$.

18. (Previously Presented) An optical imaging system comprising:

at least one optical phase filter including a phase mask; and

a controller for positioning the optical phase filter to alter phase of a wavefront of the imaging system to change at least a selected one of depth of field and aberration tolerance;

wherein the phase mask implements a cubic phase function when moved by the controller.

19. (Original) The optical imaging system of claim 18, wherein the cubic phase function is of the form:

$P(x,y) = \alpha\ x^3 + \beta y^3 + \delta x^2 y + \gamma\ xy^2$

where P(x,y) represents phase as a function of the spatial coordinates (x,y).

20. (Cancelled)

21. (Previously Presented) The optical imaging system of claim 1, further comprising means for adjusting one or both of aperture and focal length of the system, the first controller repositioning the optical phase filter so that the depth of field and aberration tolerance, as selected, remain substantially fixed irrespective of the means for adjusting.

22. (Cancelled)

23. (Previously Presented) A method for variably affecting the wavefront of an optical system to selectively control imaging properties, the method comprising:

positioning one or more optical phase filters in the optical system;

repositioning the optical phase filters to affect the imaging properties; and

capturing images from the optical system and post-processing a digital representation of the images to reverse effects induced by the optical phase filters.

24. (Original) The method of claim 23, further comprising the steps of automatically responding to user selection of the imaging properties to reposition the optical phase filters to effect phase changes of the wavefront to achieve the selected imaging properties.

25. (Previously Presented) The method of claim 23, further comprising adjusting one or both of focus and aperture of the imaging system, the step of repositioning comprising repositioning the optical phase filters to counter imaging effects associated with the step of adjusting one or both of focus and aperture.

26. (Currently Amended) A method for variably affecting the wavefront of an optical system to achieve selected image properties of the optical system, the method comprising the steps of:

moving a phase filter within the optical system to modify phase of the wavefront; and

forming a final image by post processing data from a detector of the optical system to reverse effects induced by the phase filter and achieve the selected image properties.

27. (Original) The method of claim 26, further comprising the step of modifying one or both of a focal length and aperture of the optical system, the step of moving comprising the step of moving the phase filter to compensate for modification of the focal length and aperture such that image properties remain substantially unchanged.

28. (Original) The method of claim 27, the image properties comprising one or more of depth of field, aberration tolerance and aliasing properties.

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29. (Currently Amended) A method for variably affecting the wavefront of an optical system to achieve selected image properties of the optical system, the method comprising the steps of:

moving at least two phase filters within the optical system to modify phase of the wavefront; and

forming a final image by post processing data from a detector of the optical system to reverse effects induced by the phase filters and achieve the selected image properties.